

SparkBoard

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University of Washington

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Authors Note. This presentation was prepared for

CSE 583: Software Development for Data Scientists taught by Professor David Beck



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Target users, Component Specs, Interaction Diagram

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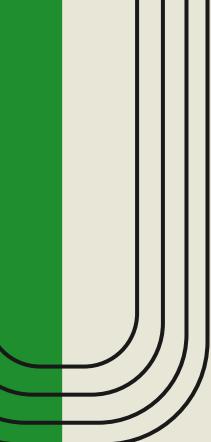
SPARKBOARD

Demonstration

5

EVALUATION

Analysis, reflection, further implications

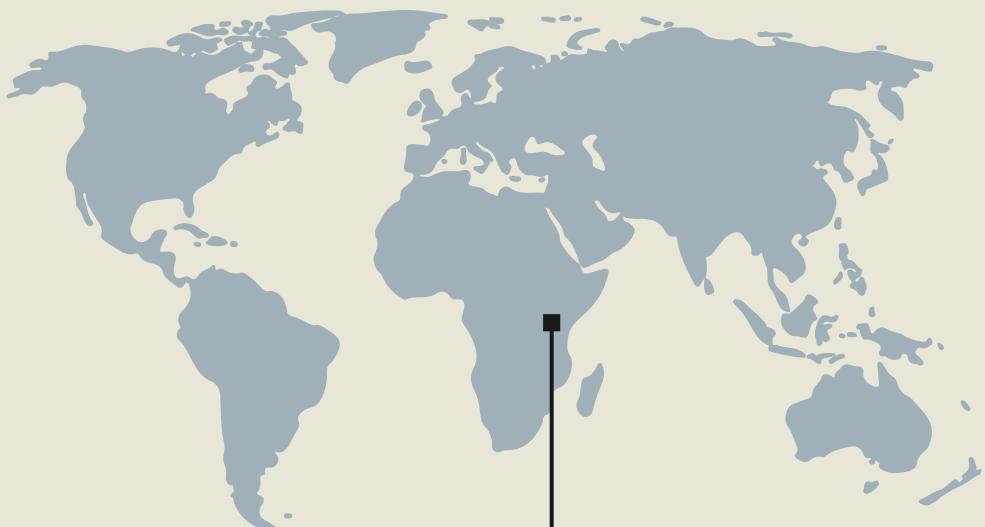


01

PROBLEM STATEMENT

Background, Problem, and Proposed
Solution

BACKGROUND



KAMPALA,
UGANDA

Lack of universal energy

Relationship with electricity usage

Informal connection modalities

Safety and power quality

DATA

QUANTITATIVE TEMPORAL

Electric meter sensors installed in community homes measuring:

- Voltage
- Current
- Power
- Frequency

QUALITATIVE SURVEY

Wiring inspection and consumption survey:

- Type of connection
- Bill payments
- Gender
- Rent vs own

SOFTWARE SOLUTION

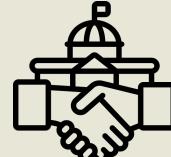
Create an interactive dashboard to visualize electricity consumption trends in informal community settlements



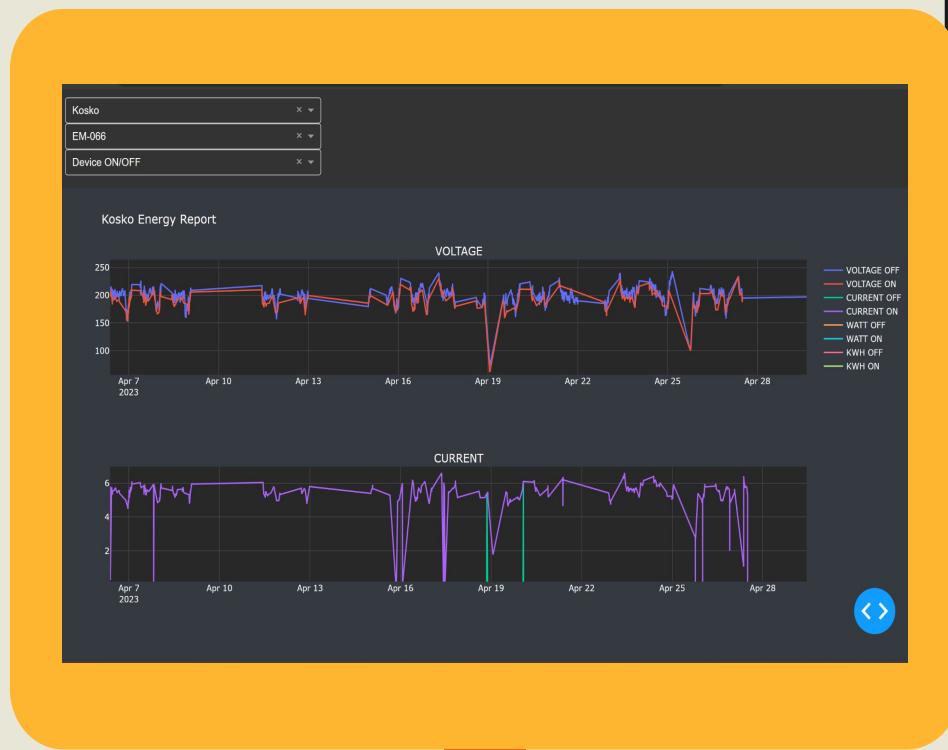
Researchers

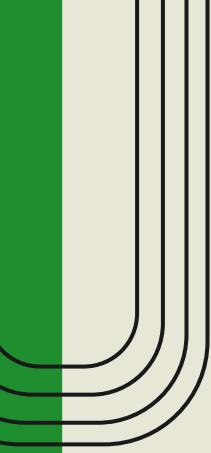


Utility



Policymakers



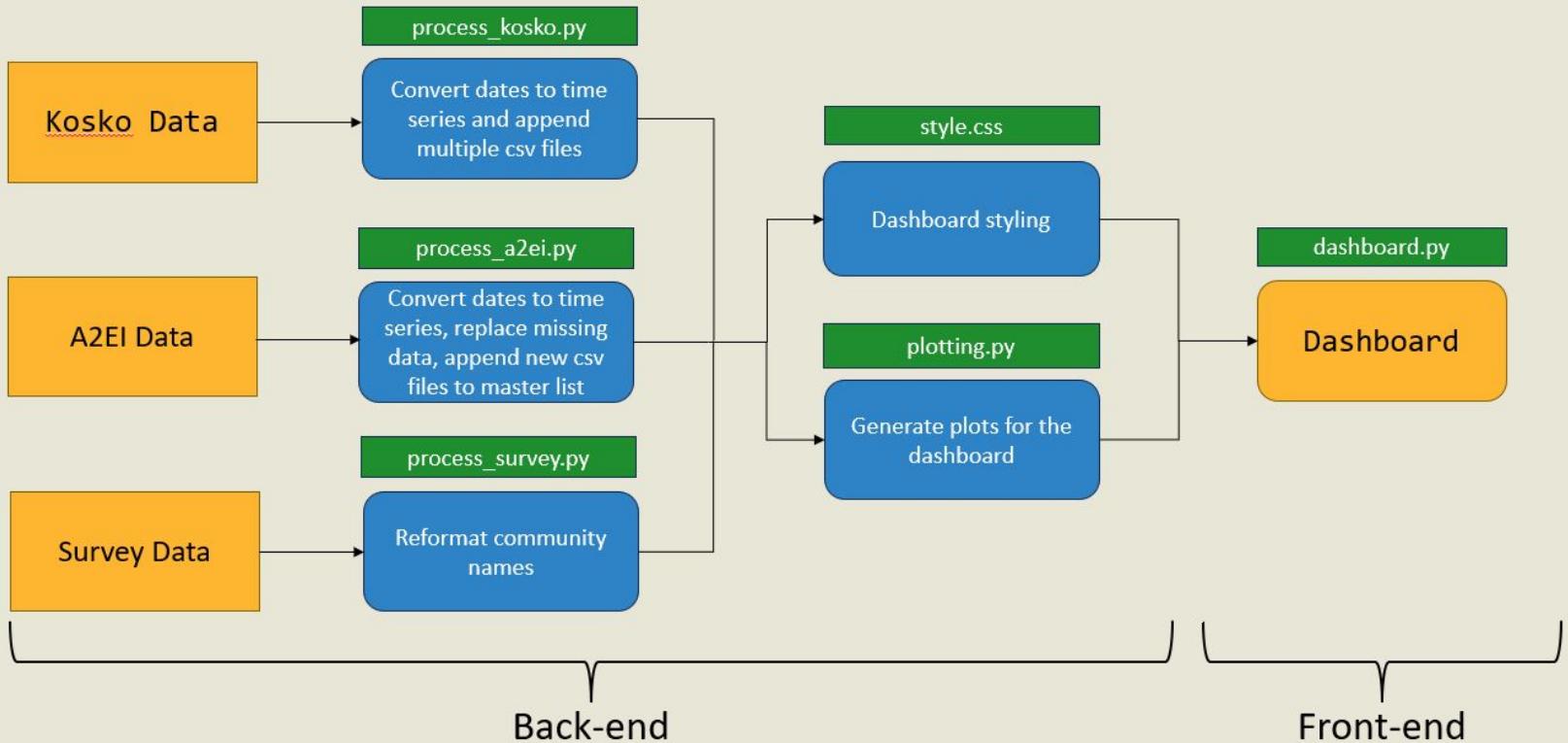


02

SYSTEM DESIGN

Target users, component specs, interaction
diagram

SOFTWARE DESIGN





IMPLEMENTATION

Data, modules, testing/debugging

REPOSITORY

Repo Structure

This following is the tree for this project:

```
CSE583-Electric-Cooking/
├── assets/
│   └── style.css
└── data/
    ├── A2EI/
    ├── Kosko/
    └── Surveys/
├── doc/
    ├── Component Specification.md
    ├── Electric Cooking Technology Review.pdf
    ├── Electric Cooking Technology Review.pptx
    ├── Functional Design.md/
    │   └── Interaction Diagram.pdf
└── example/
    └── example.md
```

Repo Structure...

```
└── example.md
├── sparkboard/
│   ├── images/
│   └── tests/
│       ├── __init__.py
│       └── test_main.py
├── __init__.py
├── plotting.py
├── process_a2ei.py
├── process_kosko.py
├── process_survey.py
├── processing.py
│   └── setup.py
└── data_processing/
├── LICENSE
└── README.md
└── dashboard.py
└── environment.yml
```

REPOSITORY

📁 .github/workflows	Create python-package-conda.yml
📁 assets	Revert "Removing unneeded assets, dashboard.py is com...
📁 data	Add files via upload
📁 doc	Updated Component Specifications.md
📁 example	Update example.md
📁 sparkboard	Pylint update process_kosko.py
📄 .gitignore	Undoing gitignore changes
📄 LICENSE	Initial commit
📄 README.md	Centered logo
📄 dashboard.py	Huge overhaul of testing frame work im tired :(
📄 environment.yml	new yml

REPOSITORY

The image shows a file repository interface with two main sections.

Left Pane:

- e-cook / data /
- ericbehling Add files via upload
- Name
- ..
- A2EI
- Kosko
- Survey

Right Pane:

- e-cook / sparkboard /
- saryasuda Pylint update process_kosko.py X
- Name
- ..
- images
- __init__.py
- plotting.py
- process_a2ei.py
- process_kosko.py
- process_survey.py
- processing.py
- setup.py
- testing_main.py

SparkBoard



This is a repository for the CSE 583 class project. The purpose of this project is to develop a software to analyze, synthesize, and process data from electric meter sensors along with individual surveys to understand trends with regards to power quality when electric cooking events are occurring in informal communities in Kampala, Uganda. The software will output a dashboard with data visualization to assist researchers, inform policies, enable decision-making for electric utilities, and provide usage information for community members.

How to run the dashboard

1. Download the repository onto your local system.
2. Do the following commands in your terminal:

```
1 git clone git@github.com:CSE583-Electric-Cooking/e-cook.git
2 cd e-cook/
3 conda env create -f environment.yml
4 conda activate ecook
5 python dashboard.py
```

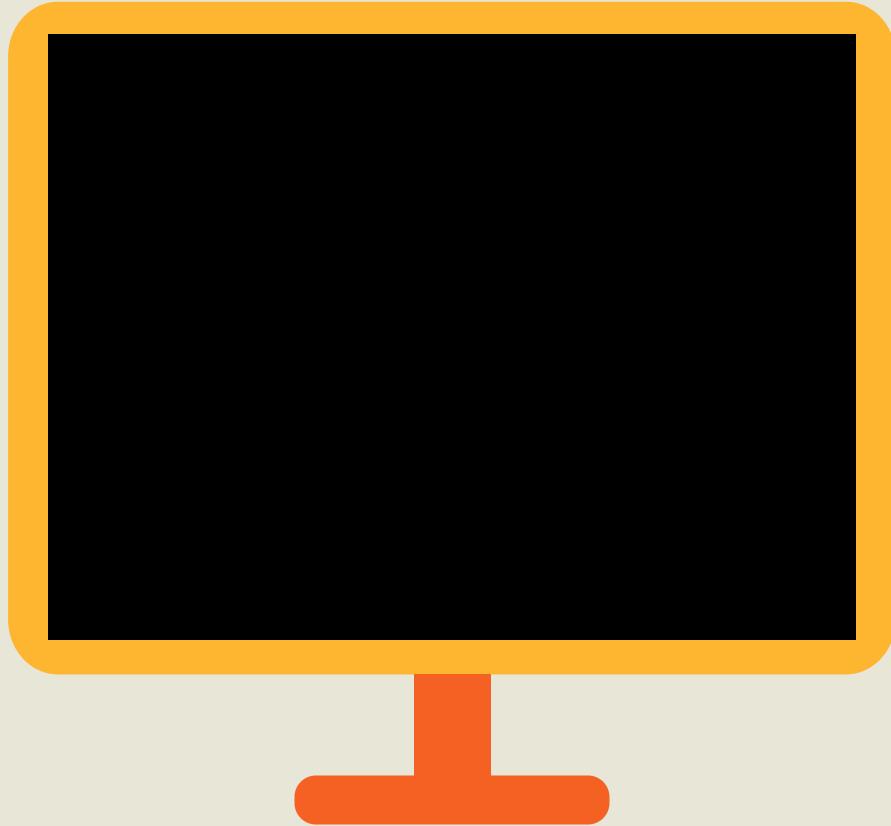
3. Click the hyperlink that appears on the shell screen to open [SparkBoard](#) in your web browser.
4. Toggle between the meter data sets (A2El and Kosko) and the survey data to see different visualizations of the data. Refer to the examples folder for further information on how to use the software package.

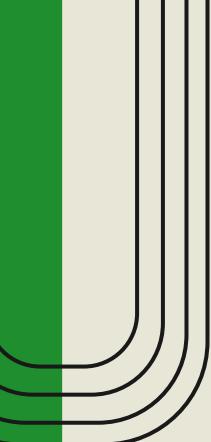


SparkBoard

Demonstration

Demonstrations





05

EVALUATION

Analysis, reflection, further implications

LESSONS LEARNED

1) Collaboration and version control

- a) Clarity in responsibilities
- b) Merge confusions

2) Workflow sequencing

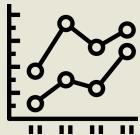
- a) User story → functional design → component design → tests → modules
→ debugging

3) Visualization tricks / tools

- a) How to better show data
- b) Data management (qualitative vs quantitative)

4) Test Development

FUTURE DEVELOPMENT



Statistical Display



User Interface / Interactivity



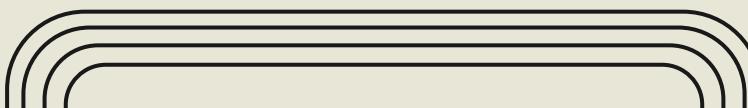
Test Writing



Real-time Updates



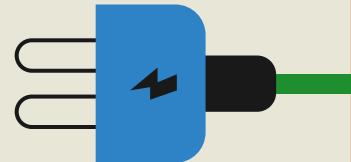
**THANK YOU
QUESTIONS?**



BACKGROUND CONTEXT

Limited Access to Energy in Developing Communities

Developing communities often face challenges in accessing energy, especially electricity



Controversial Relationship with Electricity in Informal Settlements

Financial and social barriers contribute to a controversial relationship with electricity

Perception of electricity as "expensive," "unsafe," and causing frequent outages

Alternative Fuel Sources in Informal Settlements

Charcoal and biomass become predominant fuel sources for cooking



Poses serious health risks, particularly indoor air pollution

Informal Connections to Electricity

Apprehension leads community members to seek local electricians for informal electricity

May be unsafe-e.g., improper grounding, live/exposed wiring, and poor connection quality

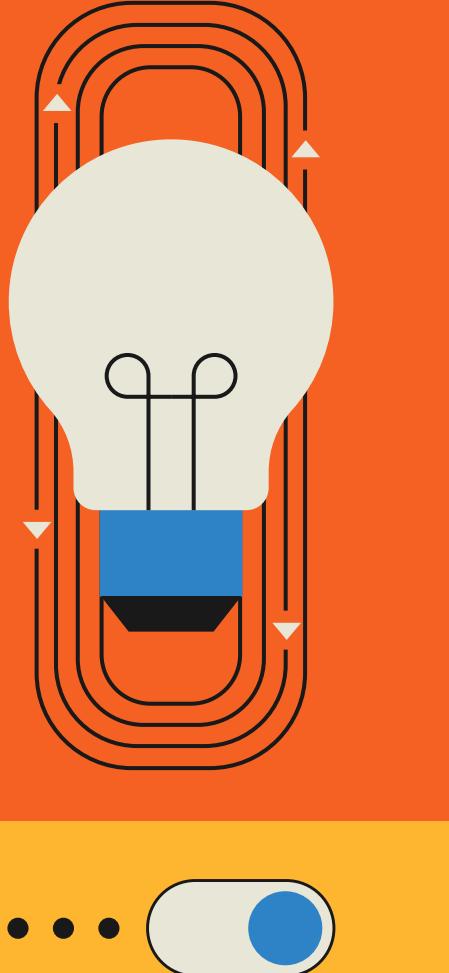


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EVALUATION

Performance Analysis, User Testing, App Comparison

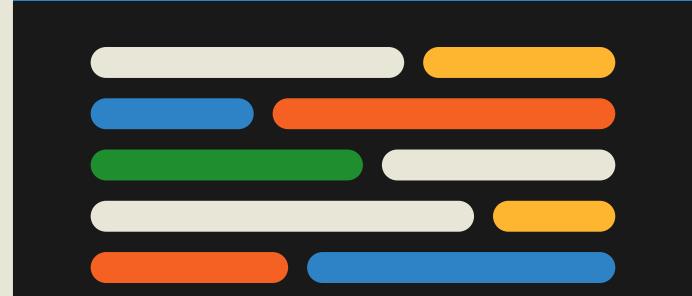
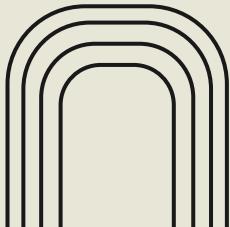
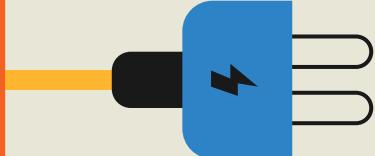
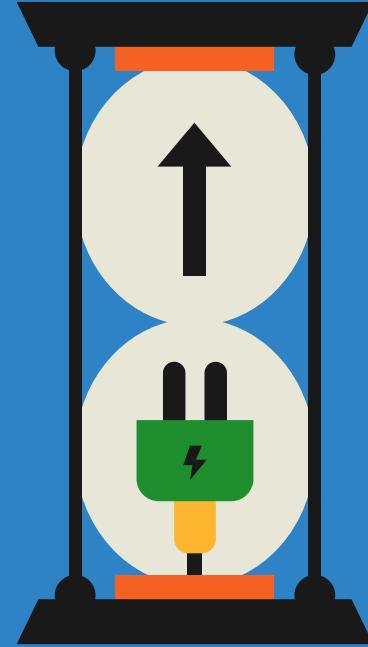
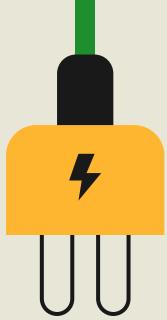
05

CONCLUSION

Analysis, Reflection, Implication for Future Development

ELECTRICITY CONSUMPTION CONSULTING

Here is where your presentation begins



CONTENTS OF THIS TEMPLATE

You can delete this slide when you're done editing the presentation

FONTS	To view this template correctly in PowerPoint, download and install the fonts we used
USED AND ALTERNATIVE RESOURCES	An assortment of graphic resources that are suitable for use in this presentation
THANKS SLIDE	You must keep it so that proper credits for our design are given
COLORS	All the colors used in this presentation
ICONS AND INFOGRAPHIC RESOURCES	These can be used in the template, and their size and color can be edited
EDITABLE PRESENTATION THEME	You can edit the master slides easily. For more info, click here

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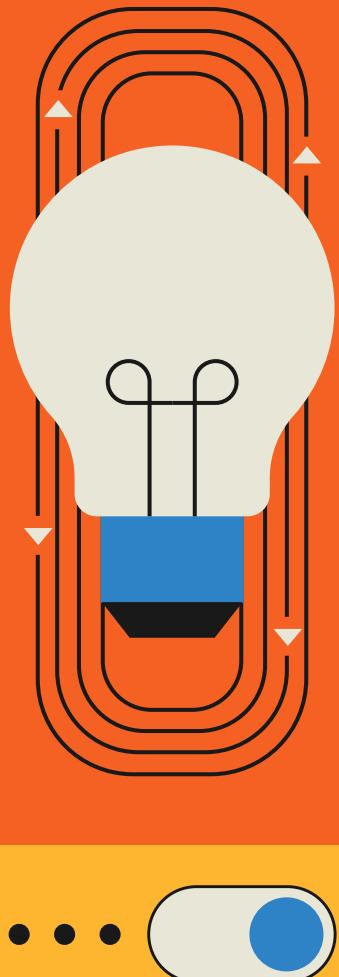


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You can describe the topic of the section here

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You can describe the topic of the section here

04

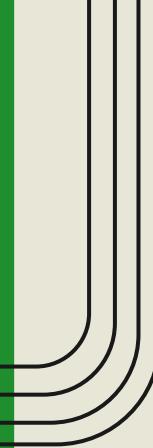
IMPLEMENTING CHANGES

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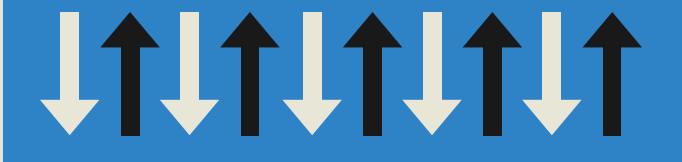
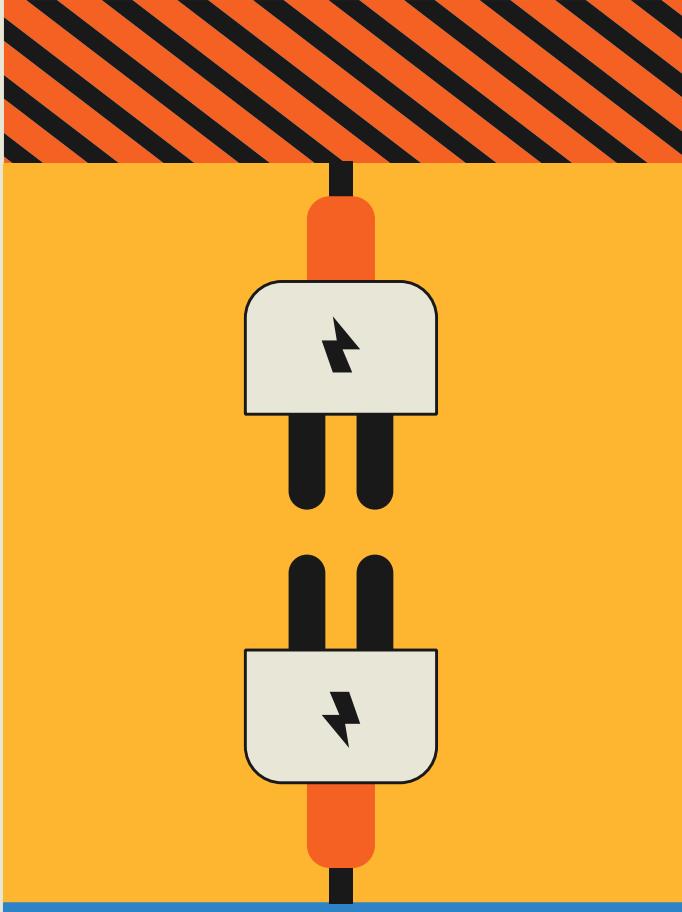
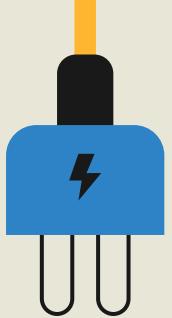


“This is a quote, words full of wisdom that someone important said and can make the reader get inspired.”

—SOMEONE FAMOUS

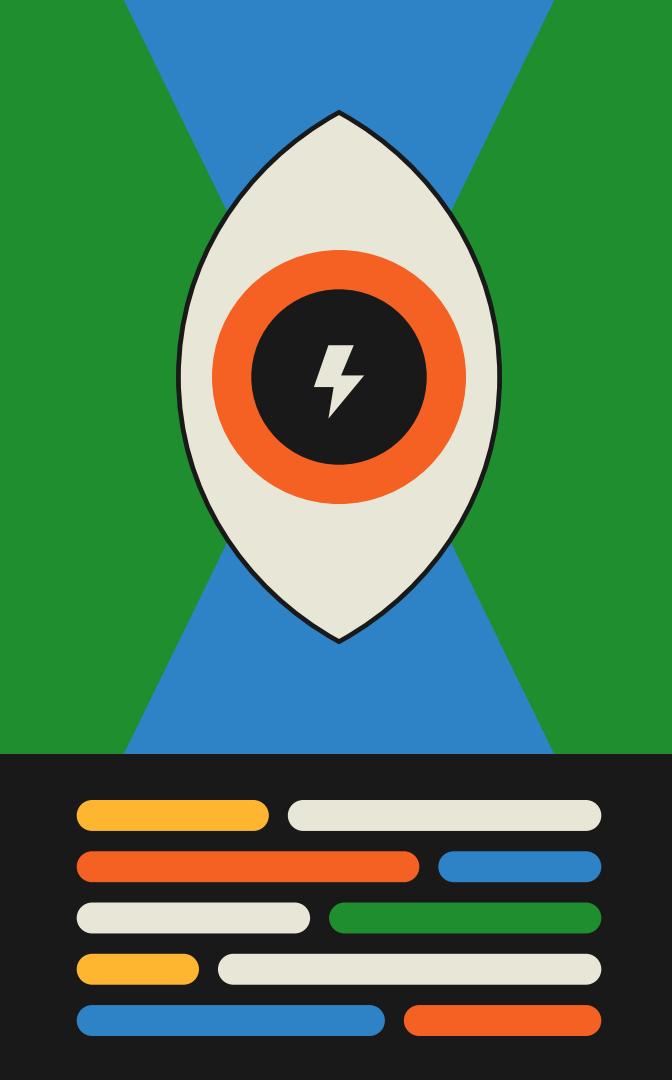


01



PROJECT & STRATEGY

You can enter a subtitle here if you need it



PROJECT & STRATEGY DEFINITION

You can give a brief description of the topic you want to talk about here. For example, if you want to talk about Mercury, you can say that it's the smallest planet in the entire Solar System

STRATEGIC PROJECT PLANNING



STRATEGIC PROJECT PLANNING



MISSION

Venus has a beautiful name and very high temperatures

VISION

Jupiter is a gas giant and the biggest planet of them all



OBJECTIVES

Despite being red, Mars is actually a very cold place

KEY INITIATIVES

Saturn is a gas giant composed mostly of hydrogen and helium





STRATEGIC MAP & SCORECARD

PERSPECTIVES		STRATEGIC OBJECTIVES			
FINANCIAL		F1-Insert your own text	F2-Insert your own text	F3-Insert your own text	F4-Insert your own text
CUSTOMER		C1-Insert your own text	C2-Insert your own text	C3-Insert your own text	C4-Insert your own text
INTERNAL PROCESS		I1-Insert your own text	I2-Insert your own text	I3-Insert your own text	I4-Insert your own text
LEARNING & GROWTH		L1-Insert your own text	L2-Insert your own text	L3-Insert your own text	L4-Insert your own text

MARKET

STRATEGIC OPTIONS: RISKS

New

MARKET
DEVELOPMENT
STRATEGY

Current

MARKET
PENETRATION
STRATEGY

DIVERSIFICATION
STRATEGY

PRODUCT
DEVELOPMENT
STRATEGY



Use a different
color for the
strategic
option you will
recommend
the company
to choose

Current

New

PRODUCTS

IMPACT OF THE RISKS

10%

EARTH

Earth is the only planet with life

20%

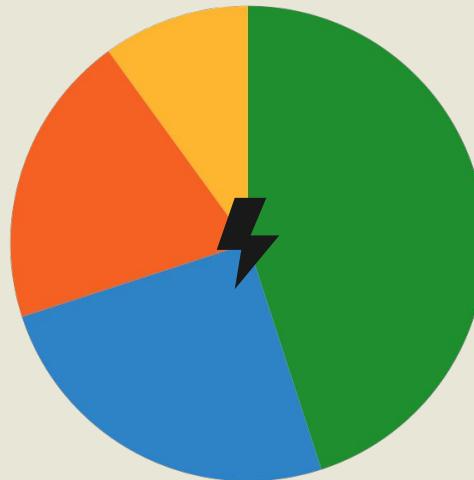
NEPTUNE

Neptune is very far from Earth

MARS

Despite is red, Mars is actually very cold

45%



SATURN

Saturn is a gas giant with several rings

25%

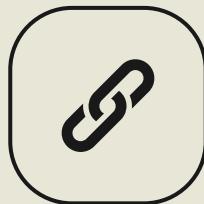
Follow the link in the graph to modify its data and then paste the new one here. [For more info, click here](#)

CORPORATE STRATEGIES



MARS

Despite being red, Mars is actually a cold place. It's full of iron oxide dust



VENUS

Venus has such a beautiful name and is the second planet from the Sun



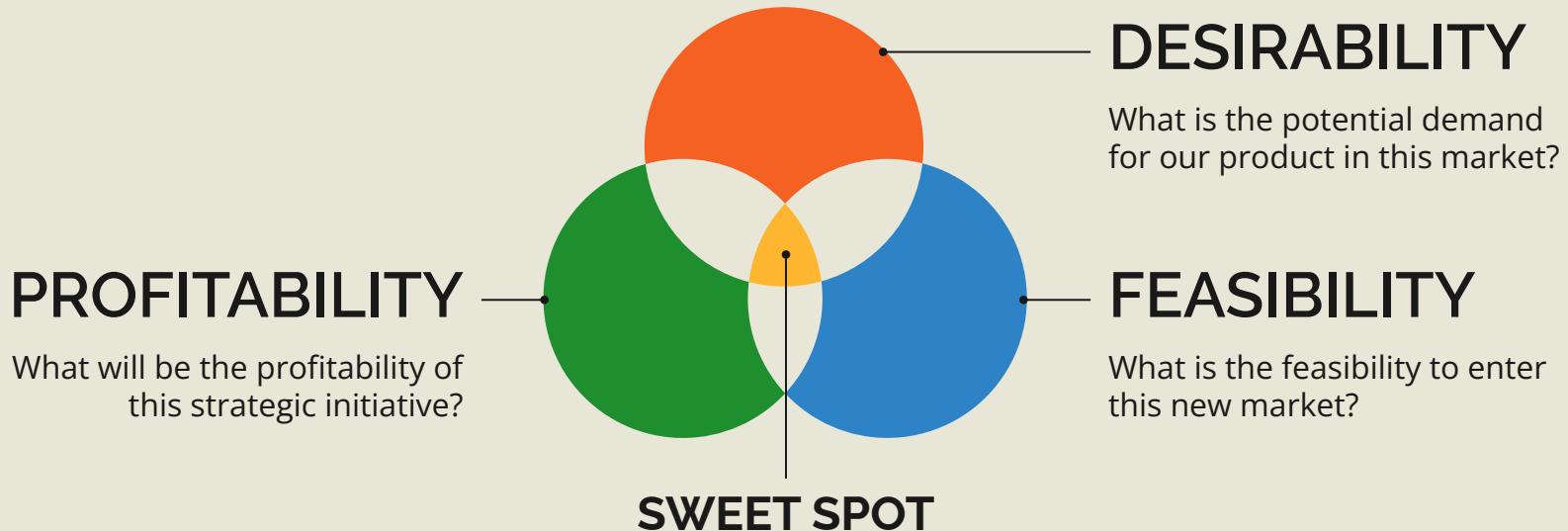
MERCURY

Mercury is the closest planet to the Sun and also the smallest of them all

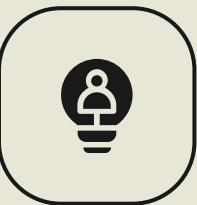
KEY DRIVERS OF THE PROFITS

	DESCRIPTION	EXAMPLE
THE SITUATION	Provide a neutral description with facts that you know your audience will agree on	Our company has been selling its products in the US for 10 years, with an annual profit growth above 10%
THE COMPLICATION	The complication is actually a very desired change of the current situation	With a market share already above 40%, profit growth will be limited in the US
THE QUESTION	The question that implicitly results from the complication	Should we enter the European market at this moment?

NEW MARKET, PRODUCT & COMPANY



STRATEGIC PERSPECTIVES



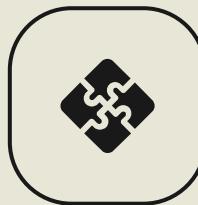
MARS

Despite being red, Mars is actually a very cold planet



SATURN

Saturn is composed mostly of hydrogen and helium



JUPITER

Jupiter is a gas giant and the biggest planet in the Solar System



NEPTUNE

Neptune is the fourth-largest planet in the Solar System

AWESOME WORDS

STRONG BUSINESS PLAN

POLITICAL

Replace the text with
your own here

ECONOMICAL

Replace the text with
your own here

SOCIAL

Replace the text with
your own here

TECHNOLOGICAL

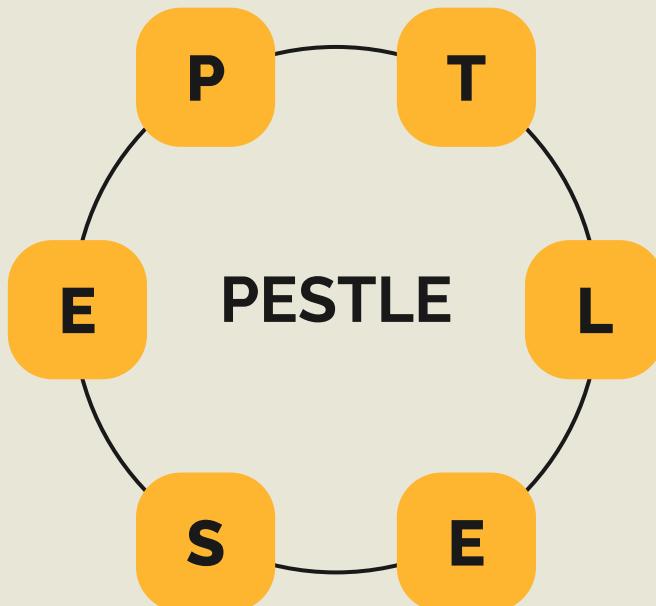
Replace the text with
your own here

LEGAL

Replace the text with
your own here

ENVIRONMENTAL

Replace the text with
your own here



STRONG BUSINESS CASE

PROJECT COSTS

\$4M

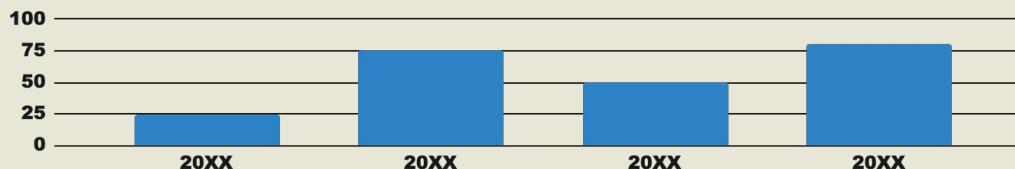
TANGIBLE BENEFITS

\$14M

NET PRESENT VALUE

\$8M

CASH FLOW (USD MILLION)



CHANGE IMPACT



Low



Medium



High

INTANGIBLE BENEFITS

Insert your own text here

STRATEGIC ALIGNMENT

Insert your own text here

SPONSOR: Sponsor name

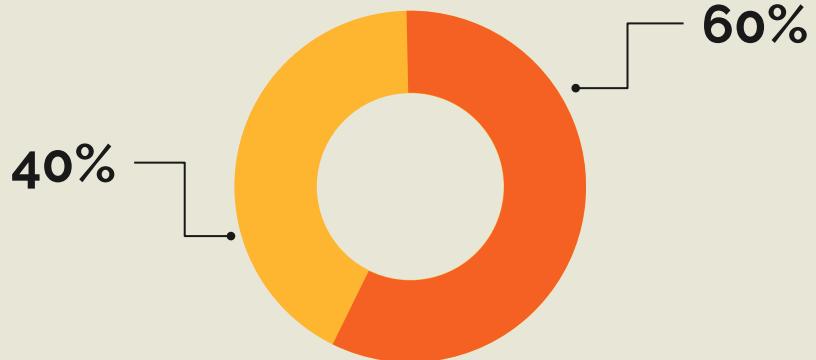
MANAGER: Manager name

RESOURCES

Follow the link in the graph to modify its data and then paste the new one here. **For more info, click here**

FINANCIAL MODEL

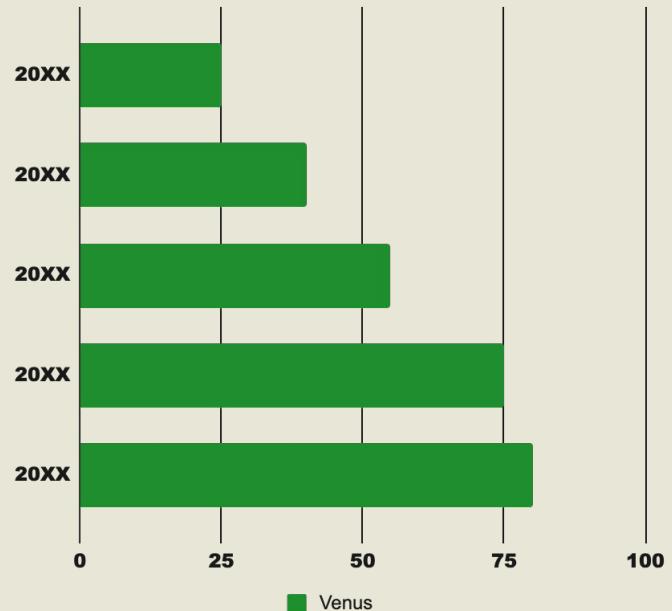
FINANCIAL MODEL



MARS
Despite is red, Mars is
actually very cold



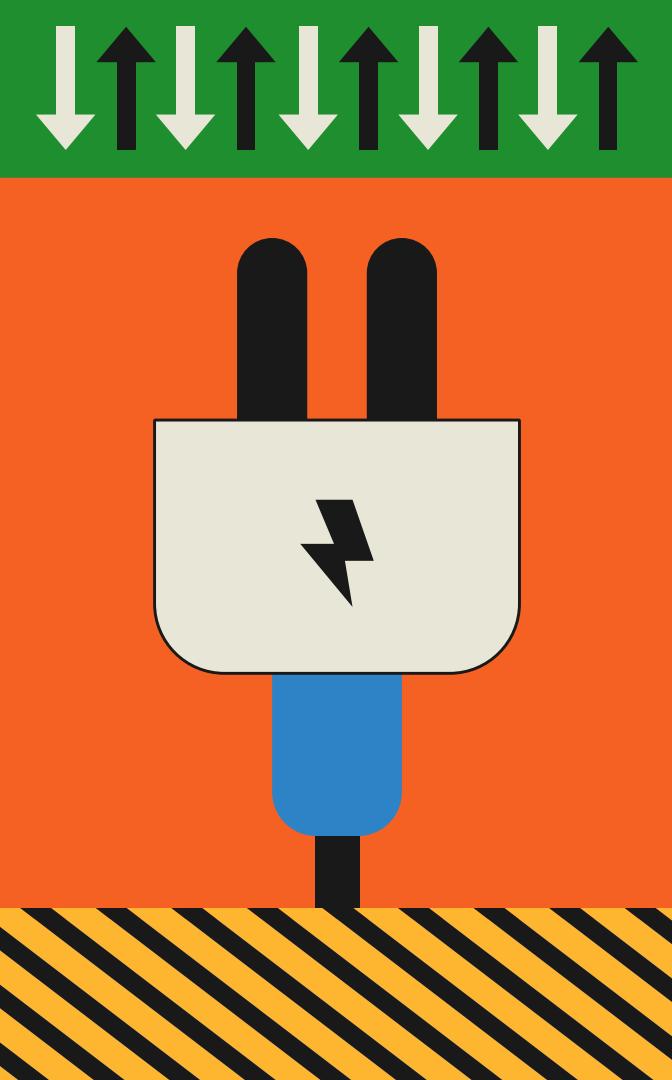
SATURN
Saturn is a gas giant
with several rings



Follow the link in the graph to modify its data and then paste the new one here. [For more info, click here](#)

PRICING STRATEGY

	BASIC	STANDARD	ADVANCED	LEADING
LEVEL	1	2	3	4
PERCENTAGE	20%	70%	9%	1%
DESCRIPTION	<ul style="list-style-type: none">Insert your description hereInsert your description hereInsert your description here	<ul style="list-style-type: none">Insert your description hereInsert your description hereInsert your description here	<ul style="list-style-type: none">Insert your description hereInsert your description hereInsert your description here	<ul style="list-style-type: none">Insert your description hereInsert your description hereInsert your description here



02

CONSULTING PROPOSAL

You can enter a subtitle here if you need it

CONSULTING PROPOSAL



SERVICES

Mercury is the closest planet to the Sun



FEES

Venus is the second planet from the Sun



INVOICES

Despite is red, Mars is actually a very cold place



EXPENSES

Jupiter is the biggest planet of them all



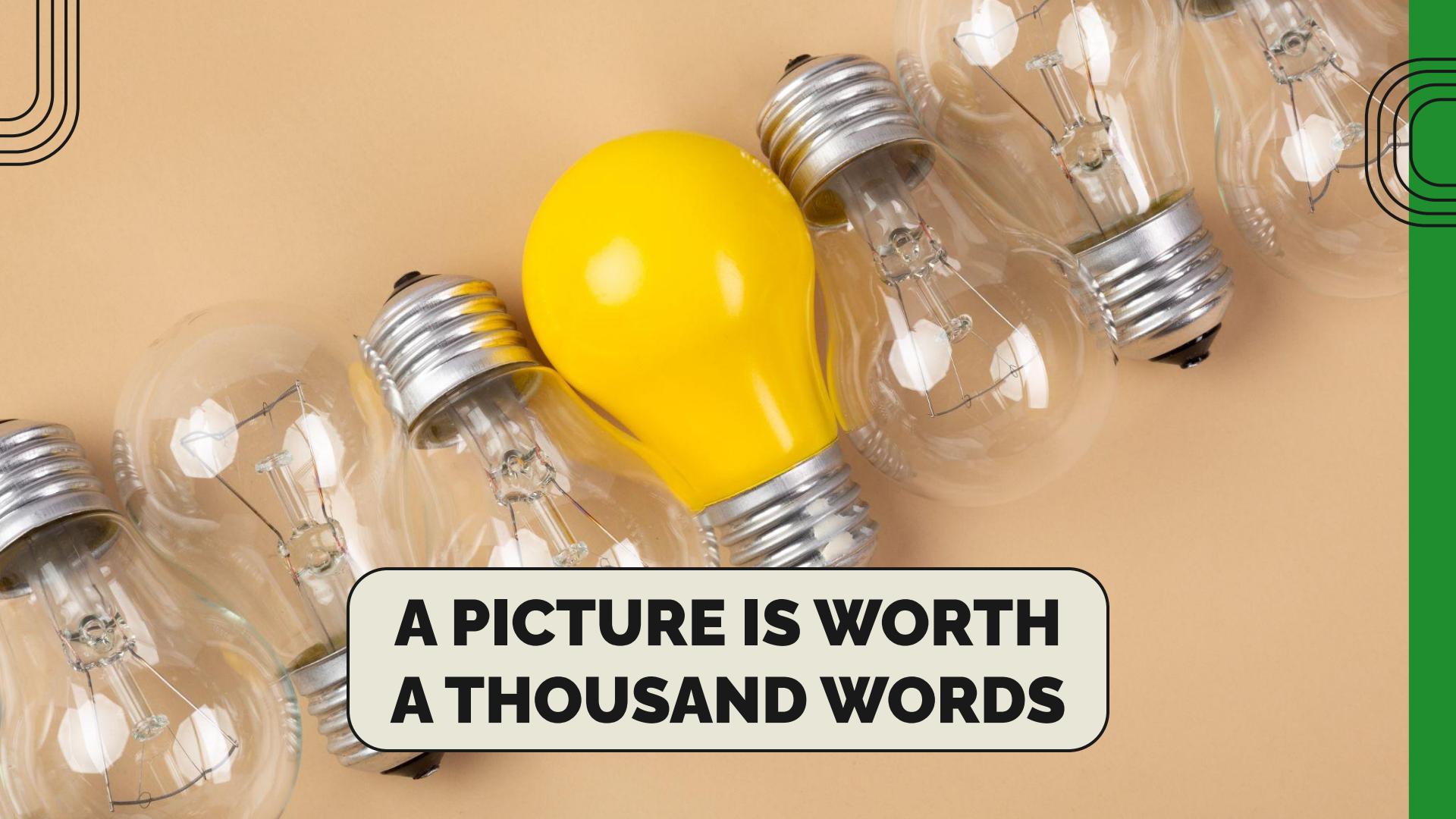
MATERIALS

Saturn is a gas giant with several rings



TERMS

Neptune is the farthest planet from the Sun



A PICTURE IS WORTH
A THOUSAND WORDS

AN IMAGE ALWAYS REINFORCES THE CONCEPT

You can replace the image.
Just right-click on it and select
“Replace image”



ANSWERS & ARGUMENTS

HOW CAN THE COMPANY REDUCE COSTS BY 10%?

REDUCE COSTS BY \$5 MILLION THROUGH
OPERATIONAL IMPROVEMENTS

OUTSOURCE NON-CORE
FUNCTIONS TO SAVE \$3M

Evaluate cost and service level
of potential partners

Select non-core functions

Choose one partner for
each function

SIMPLIFY CORE FUNCTIONS
PROCESSES TO SAVE \$1M

Design current processes

Compare current process to
best-in-class benchmarks

Adopt the best practices based
on benchmarks

REVIEW SUPPLIER COST TO
SAVE \$1M

Select and review current
supplier costs

Evaluate cost of potential
alternative suppliers

Negotiate supplier
contracts/choose options

INITIATIVE PRIORITIZATION MATRIX



IMPACT

An initiative with a high impact would mean one of the following:

- The initiative needs to happen in order to achieve the desired next and future state
- The initiative will significantly reduce the cost or increase our revenue



EFFORT

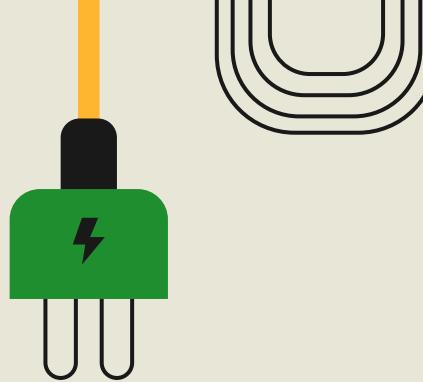
The “effort” criteria is assessed based on the following concepts:

- Ease of implementation
- Time frame required
- Resources required (number of people, offices, material supplies, total of capital investment, etc.)

PRIORITIZATION MATRIX

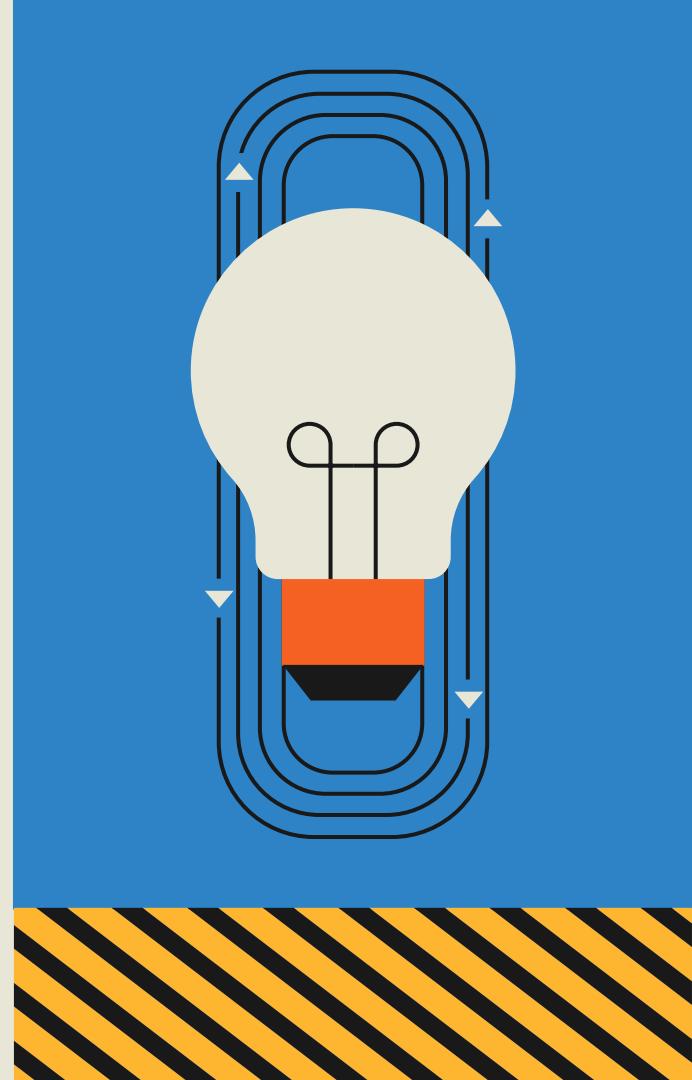
	INITIATIVE NAME	IMPACT	EFFORT
1	List all your potential initiatives		Very high
2	List all your potential initiatives		High
3	List all your potential initiatives		Low
4	List all your potential initiatives		Very low
5	List all your potential initiatives		Very high
6	List all your potential initiatives		High
7	List all your potential initiatives		Low

03



CHANGE MANAGEMENT

You can enter a subtitle here if you need it

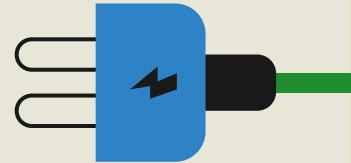


CHANGE MANAGEMENT APPROACH

Do you know what helps you make your point clear?
Lists like this one:

- They're simple
- You can organize your ideas clearly
- You'll never forget to buy milk!

And the most important thing: the audience won't miss
the point of your presentation ever again



BUSINESS CASE

Mercury is the closest planet to the Sun

1

**BUSINESS
PLAN**

Jupiter is the biggest planet of them all

2

**YOUR LOGO
HERE**

Venus is the second planet from the Sun

3

XX/XX/XX

Saturn is composed of hydrogen and helium

4

Mars is actually a very cold place

5

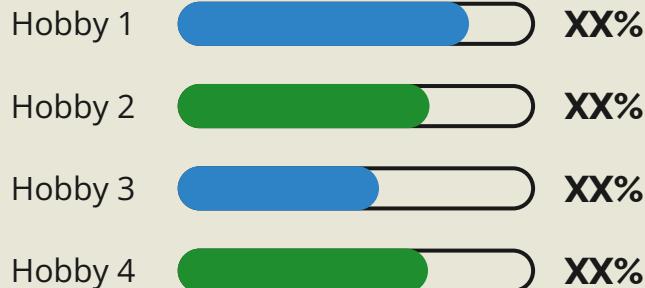
Neptune is the farthest planet from the Sun

6

COMPETITOR COMPARISON TABLE

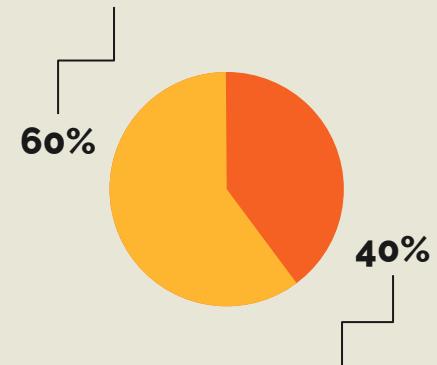
ATTRIBUTES	COMPETITOR A	COMPETITOR B	MY BUSINESS
PRICE	\$360	\$320	\$300
QUALITY	Low	Medium	High
CUSTOMER AGE	20-40	18-45	18-50
REPUTATION	Bad	Average	Good
LOCATION	Spain	Italy	USA

BUYER PERSONA



MARS

Despite its red color, Mars is actually cold



NAME:	Joe Wilson
AGE:	XX years old
JOB:	Engineer
INCOME:	\$1.500-\$1.800

VENUS

Venus has a beautiful name and is the second planet from the Sun. It's terribly hot, even hotter than Mercury. It's the second-brightest natural object in the night sky after the Moon

MERCURY
Mercury is quite a small planet

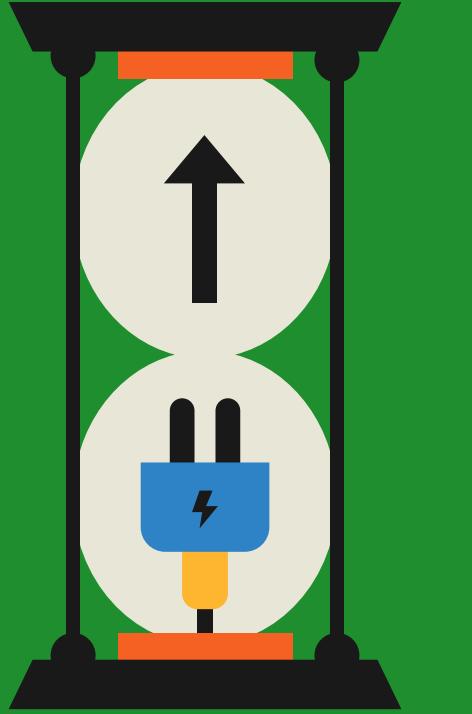
IMPLEMENT, TRACK & MANAGE

	PROGRESS	STATUS	LINK
Venus	<div><div style="width: 40%;"></div></div>	40%   	www.yourlinkhere.com
Mars	<div><div style="width: 35%;"></div></div>	35%   	www.yourlinkhere.com
Neptune	<div><div style="width: 70%;"></div></div>	70%   	www.yourlinkhere.com
Jupiter	<div><div style="width: 15%;"></div></div>	15%   	www.yourlinkhere.com
Earth	<div><div style="width: 85%;"></div></div>	85%   	www.yourlinkhere.com
Ceres	<div><div style="width: 60%;"></div></div>	60%   	www.yourlinkhere.com

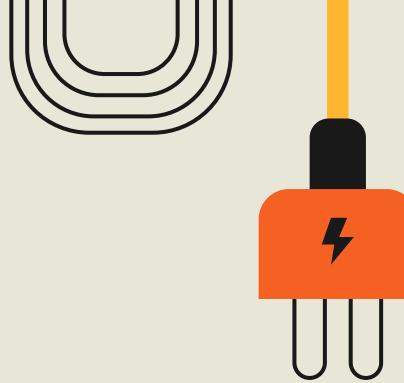


MANAGEMENT STRATEGY & PLAN

		SIZE OF THE CHANGE					CHANGE COMPLEXITY
EXTREME	Insert name of the change	Insert name of the change	Insert name of the change				
HIGH	Insert name of the change						
MEDIUM	Insert name of the change						
MODERATE	Insert name of the change						
LOW	Insert name of the change						
1 team impacted		1 business unit	1 division	Half company	Extreme		



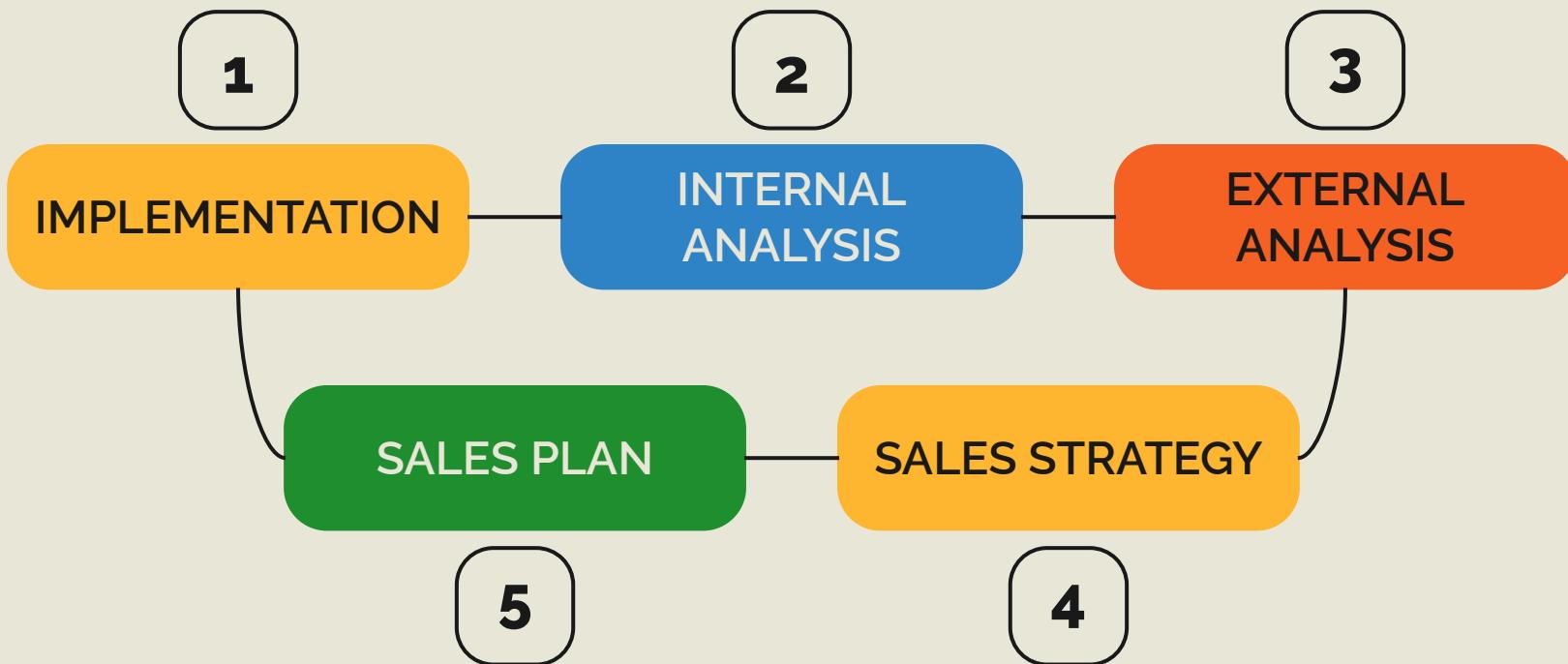
...



IMPLEMENTING CHANGES

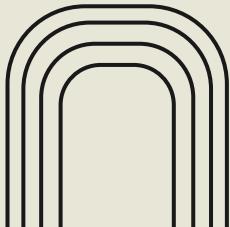
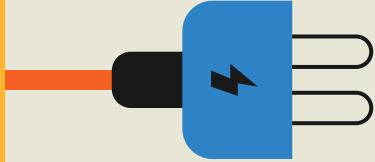
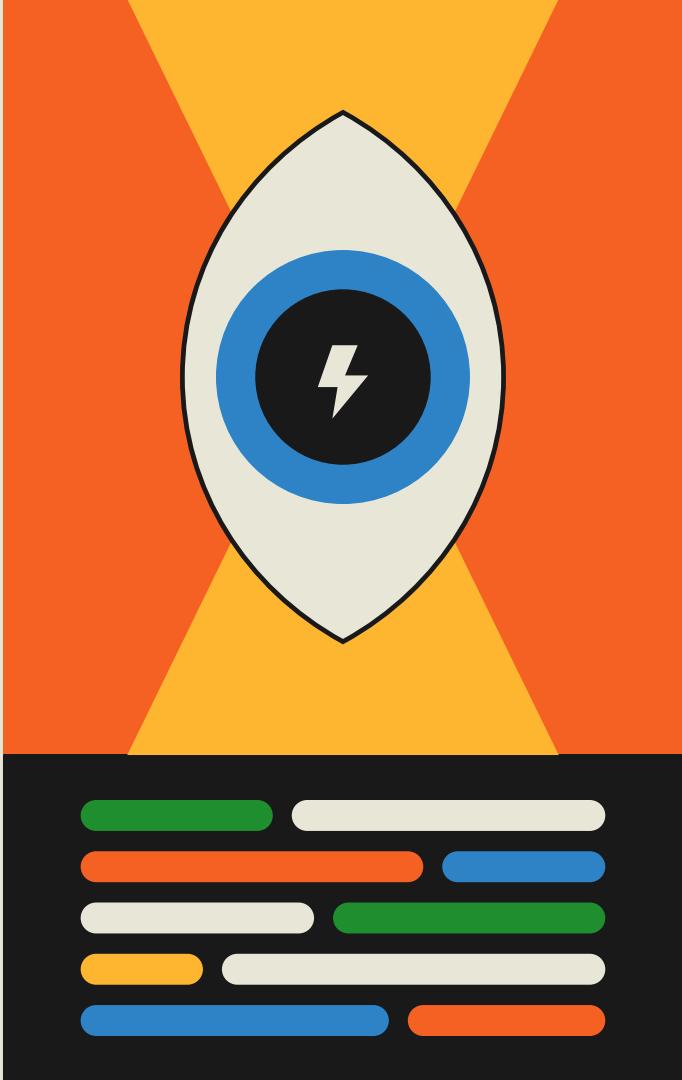
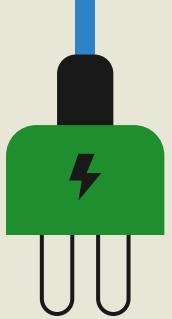
You can enter a subtitle here if you need it

SALES & STRATEGY PLAN



\$500,000

Big numbers catch your audience's attention



ABOUT THE TERMS OF THE AGREEMENT



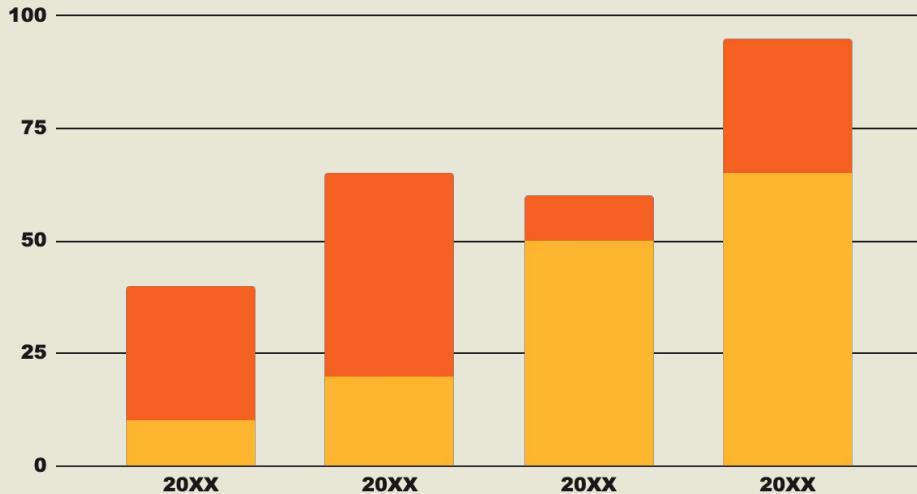
SATURN

Saturn is a gas giant with several rings



MARS

Despite is red, Mars is a very cold planet

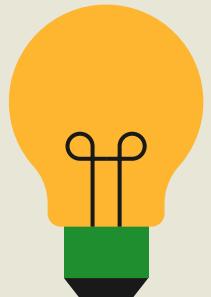


Follow the link in the graph to modify its data and then paste the new one here. [For more info, click here](#)



\$20,000

Mars is actually a very cold place



\$10,000

Mercury is a very small planet

\$15,000

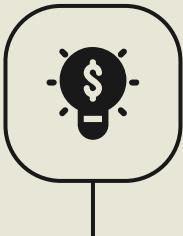
Venus has such a beautiful name



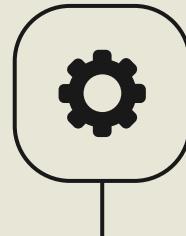
\$45,000

Saturn is a gas giant with several rings

MANAGEMENT APPROACH



Despite is red, Mars is
actually very cold



Venus is the second
planet from the Sun

JANUARY – FEBRUARY – MARCH – APRIL

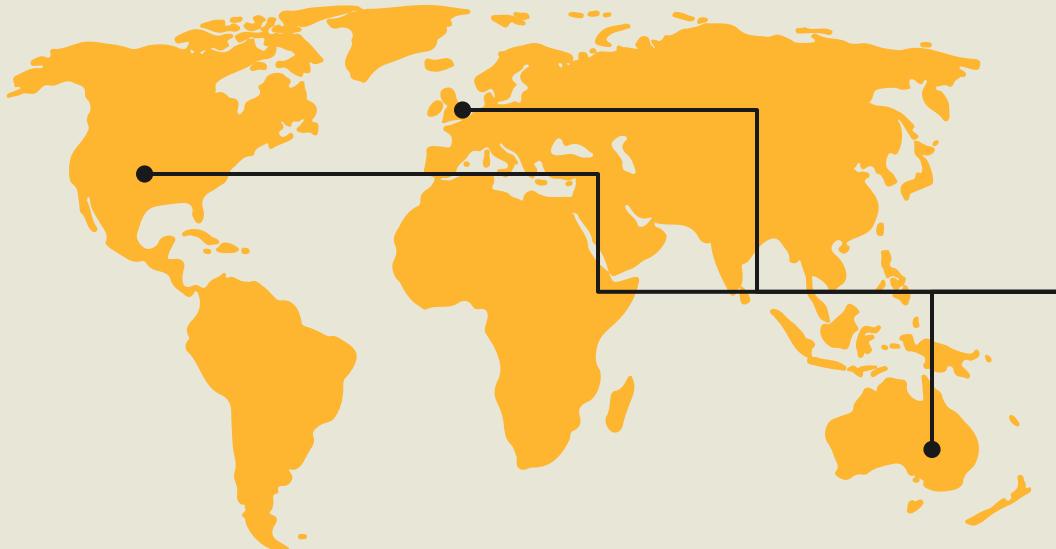


Saturn is a gas giant
with several rings



Neptune is very far
from the Sun

STRATEGIC ALLIANCES



OUR ALLIANCES

Despite being red, Mars is actually a very cold place. It's full of iron oxide dust which gives the planet its reddish cast

ANSWERS & ARGUMENTS

WRITE YOUR QUESTION

WRITE YOUR ANSWER

SATURN

Saturn is a gas giant and has several rings. It's composed of hydrogen and helium. It was named after the Roman god of wealth and agriculture

VENUS

Venus has a beautiful name and is the second planet from the Sun. It's terribly hot, even hotter than Mercury, and its atmosphere is poisonous

MARS

Despite being red, Mars is actually a very cold place, not hot. It's full of iron oxide dust, which gives the planet its characteristic reddish cast

ANSWERS & ARGUMENTS

REQUIREMENTS

Mercury is the closest planet to the Sun

DESIGN

Venus is the second planet from the Sun

IMPLEMENT

Despite is red, Mars is actually very cold

VERIFICATION

Jupiter is the biggest planet in the Solar System

MAINTENANCE

Saturn is a gas giant and has several rings

MATURITY MODEL

BASIC

Despite being red, Mars is actually a cold place. It's full of iron oxide dust

30%

STANDARD

Venus has such a beautiful name and is the second planet from the Sun

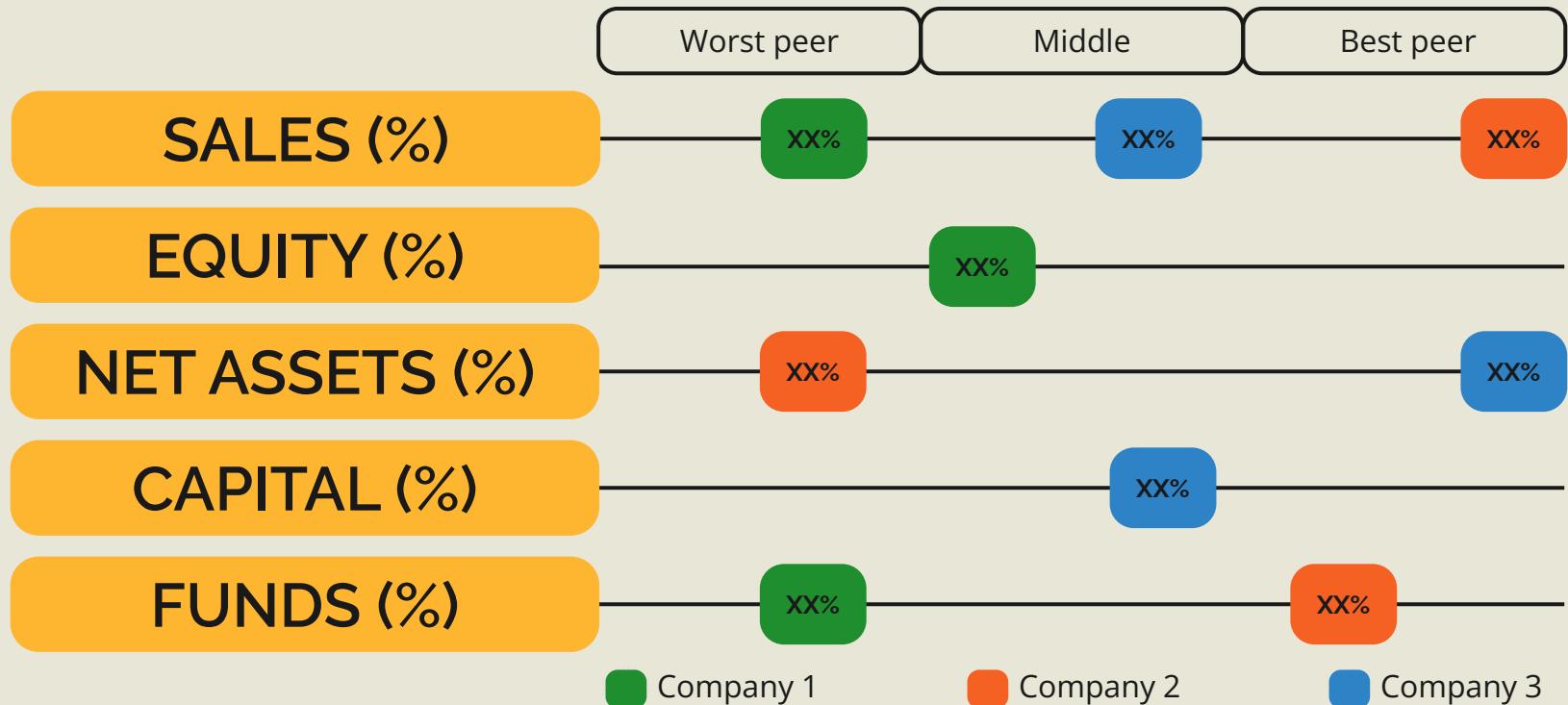
50%

ADVANCED

Mercury is the closest planet to the Sun and also the smallest of them all

70%

PROFITABILITY RATIOS



TOP 10 BUSINESS PLAN QUESTIONS

1

What is your situation?

2

What is your vision?

3

How to reach your vision?

4

What do you offer?

5

How big is the market?

6

Who are the key players?

7

How to make a difference?

8

What is your marketing plan?

9

What are your economics?

10

What do you need to start?

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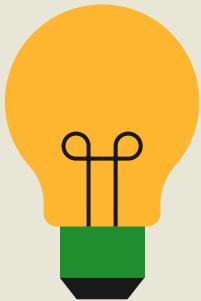


OUR TEAM



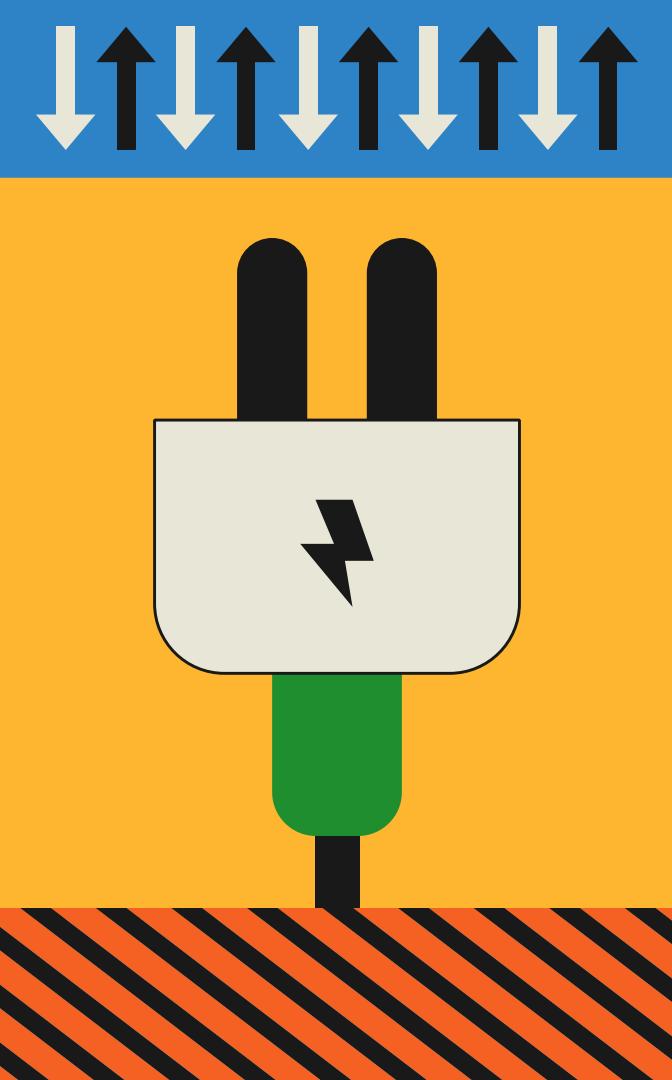
JENNA DOE

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this person here



TIMMY JIMMY

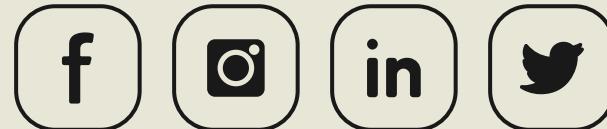
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THANKS!

Do you have any questions?

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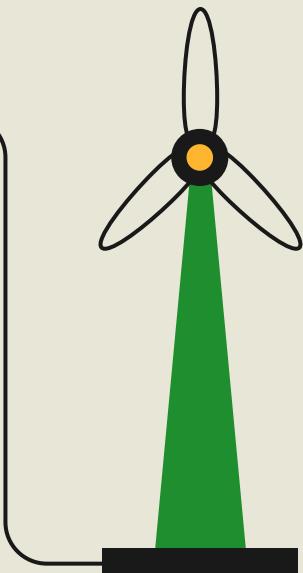
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- Green world ideas infographic

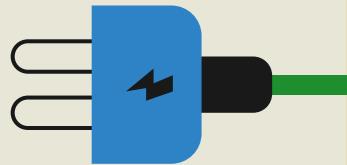


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- Happy young man laughing
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VECTORS:

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Pana



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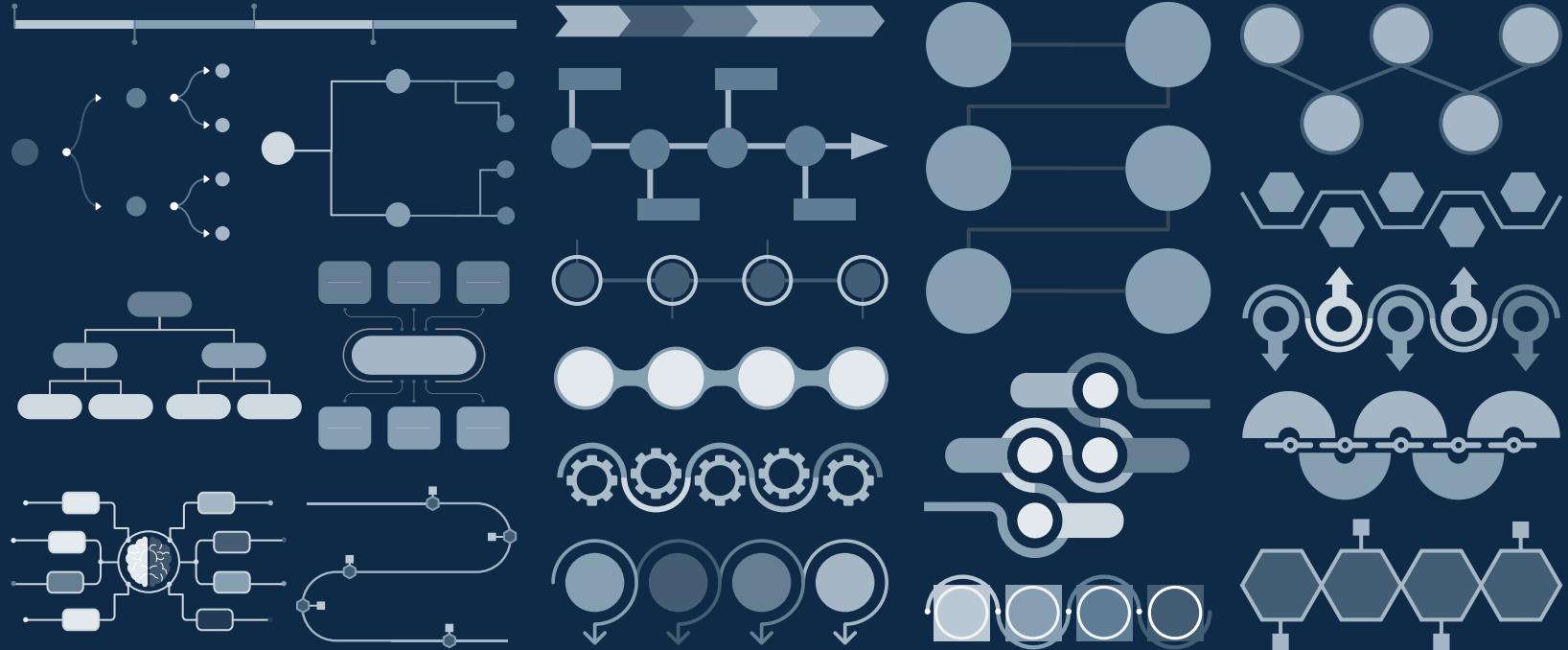
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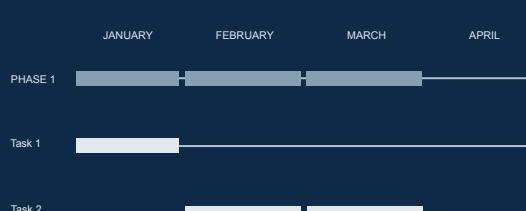
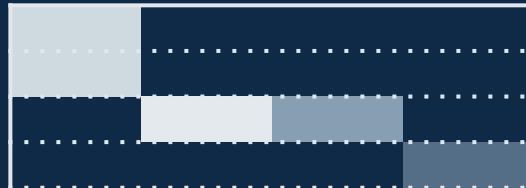
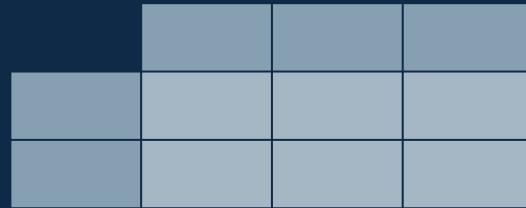
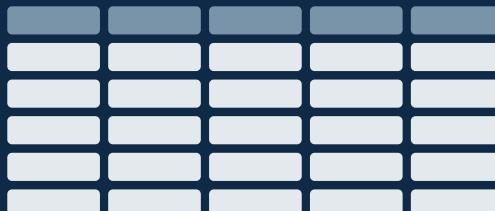
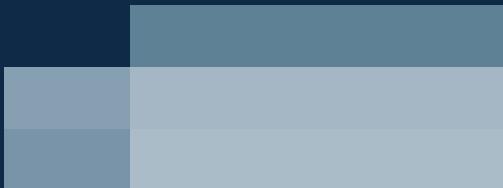
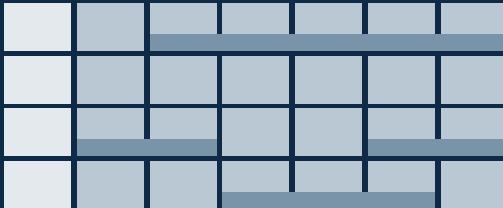
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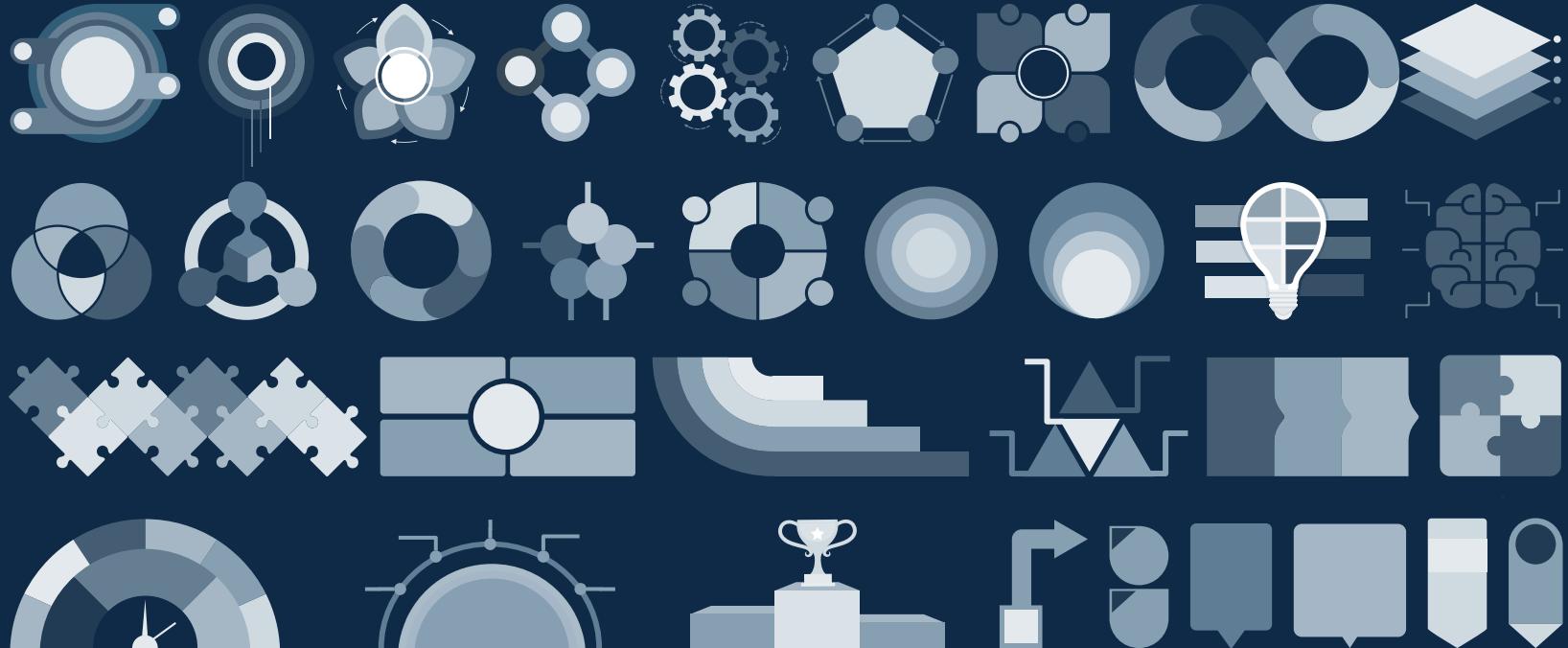
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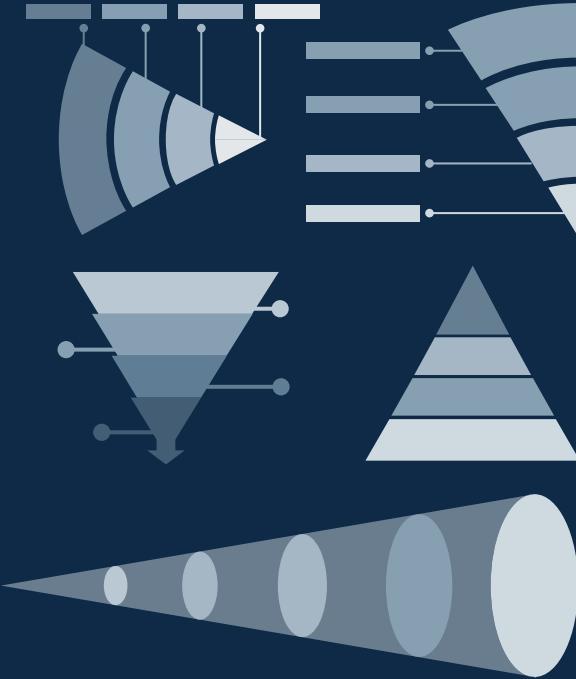
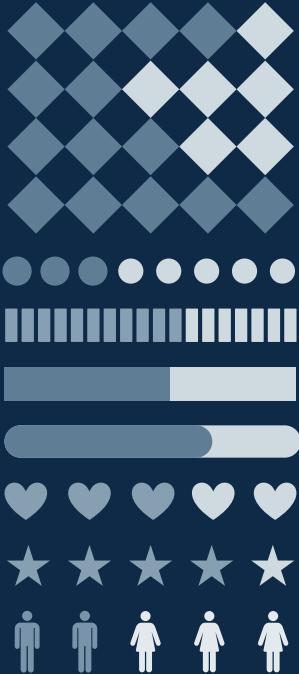
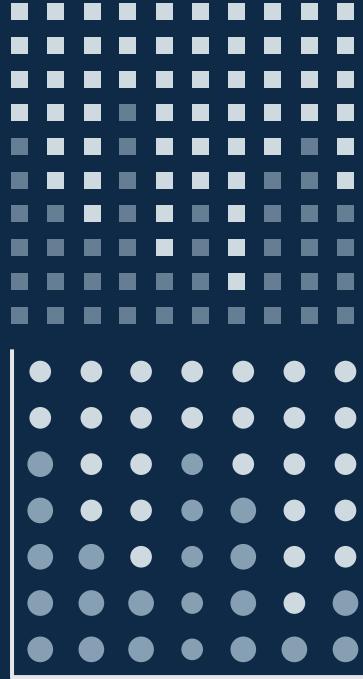












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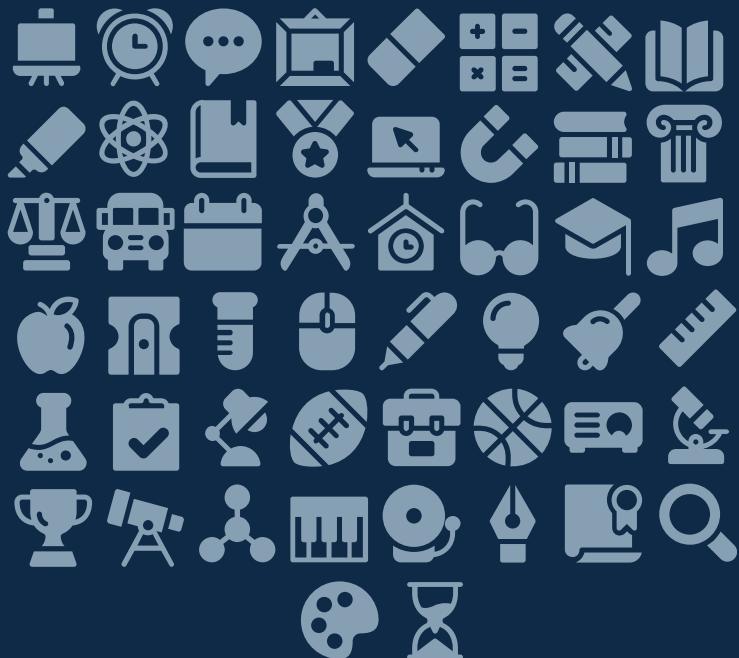
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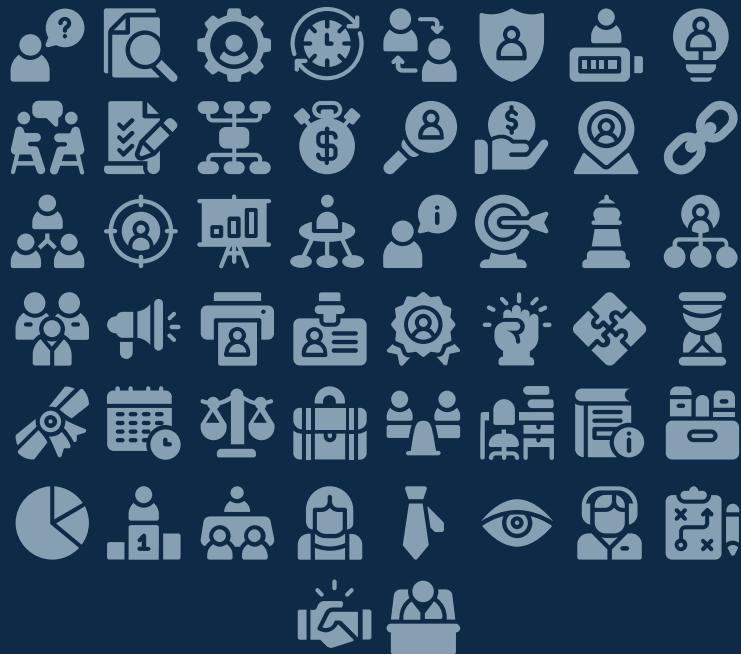
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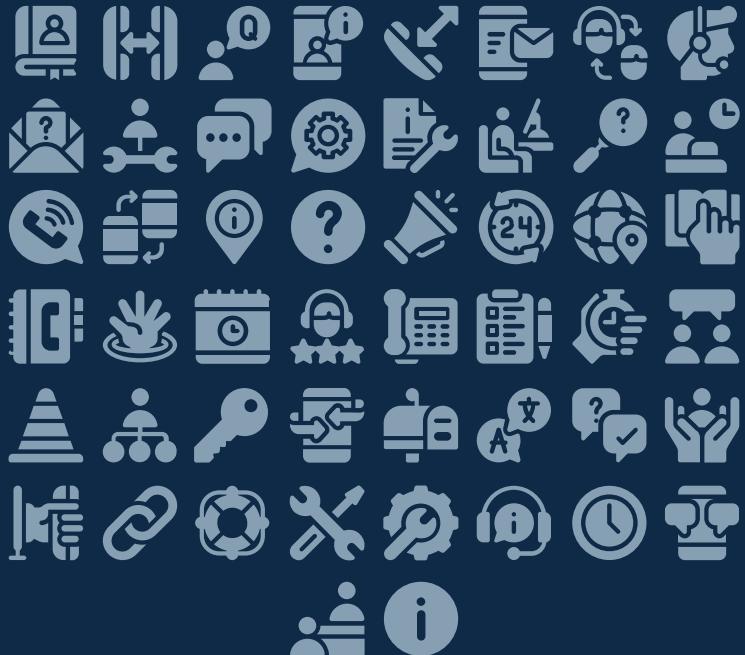
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Teamwork Icons



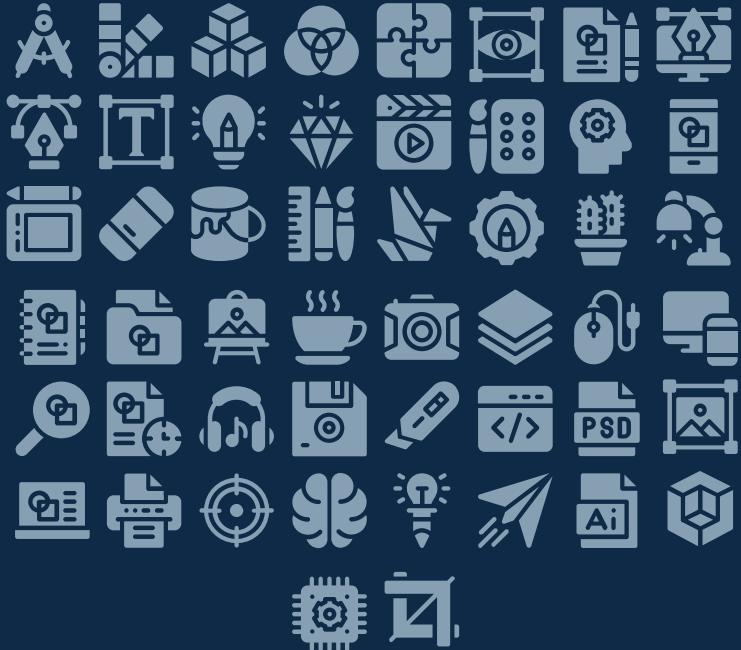
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